THE

VETERINARY JOURNAL

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Editorials.

"TRUTH" ON THE WAR-PATH AGAIN.

"ONE of the highest authorities" has again been trying to belittle his own profession, and it is astonishing that such a well-known paper as *Truth* should listen to such twaddle; and more astonishing still that it should be published. The Royal Army Veterinary Service, in France especially, appears to have upset the equilibrium of this "highest authority," and he is never tired of trying to make a sarcastic hit at the corps of which, presumably, he has many bitter personal recollections.

The first statement made concerns the horses brought back from the South African War, and is very bold and wide-sweeping. He states that "although only a few hundred horses were brought home," these spread skin diseases, glanders, and contagious lymphangitis "all through the British Isles"; and that contagious lymphangitis "spread disease from Woolwich to every artillery barracks in the country, and through them to civilian animals." To the uninitiated it would read as if the ravages of the disease became terrible; whereas every veterinarian, whether in the service or in civilian practice, knows full well that it was controlled at the time with the greatest facility.

Looking a little further down the column inspired by the "highest authority," one is struck by his great fear for the health of the horses of England after the present war. One reads, "My authority has little hope that there will be any effective effort to ensure a clean bill of health for every animal sold out of the Army."

From this it is quite evident that this "highest authority" is hopelessly out of date, and knows very little of what is going on, and has been going on for a very long time—preparatory to demobilisation. The principles of prophylaxis in relation to disease have always been carried out very efficiently in dealings with all Service animals, and the Army Veterinary Authorities can legitimately claim to have effectively protected the civil horse population in the past from the ravages of the diseases of war.

Why does the civilian buyer compete so keenly for the Army cart-horse? That in itself is a proof that he has no fear of contagious disease!

As for the statement "that the test for glanders as carried out by the Army Veterinary Service in France is a perfunctory business, and not reliable," it is a gross untruth; and for "one of the highest authorities" (which means that on an army veterinary subject he must be, or has been, an Army Veterinary Officer) to make such a statement without producing statistics and facts to prove it, reminds one of the old proverb which says "that it is a dirty bird which fouls its own nest."

By all means let this "highest authority" give his advice to isolate the animals for two or three months, and have them tested for glanders by a "competent veterinary surgeon," and let the readers of *Truth* follow this advice if they wish; but do not quite put it in that way, for it reads as if he thought very little of the professional capabilities of his colleagues when he was one of them.

For his information let it be noted, that it is by no means impossible to see the test for glanders carried out properly, carefully, and skilfully every day of the week; and that, contrary to what one might think from reading the paragraph in question, a "competent veterinary surgeon, uniformed, and respected as a "competent" veterinary officer, can be found everywhere where Army animals are congregated.

Both the Editor of *Truth* and his "highest authority" can rest assured that every precaution has already been taken, and will be taken on the return of the troops, to allay *their* pressing anxiety on behalf of the British horse-owner.

OUR PROSPECTS.

One often hears or reads two views expressed as to the prospects and future of the veterinary profession. On the one hand we are told that work is plentiful, pay good, and opportunities of rising in life frequent; on the other hand we are informed that our occupation

is a decaying one, and our chance of advancement growing "small by degrees and beautifully less." There are optimists and pessimists in every walk of life; the opinions they give as a rule depend far more on the state of their livers than on any reasoned consideration of the position or any specially discerning brain-wave that they may have It has been pretty generally assumed that veterinary work has been very brisk for those left in civil practice. In some instances this may have been so, but taking a general view we venture to doubt the accuracy of the assumption. There has been a diminishing quantity of horses, and dairy cows, which furnish us with the greater part of our cattle practice have been considerably reduced in number (some 67,000 less). Dogs, too, have declined in number. On every hand economy has been preached to our clients, and a good deal of thinking has been indulged in before money has been spent. There have been many instances of narrow vision and penny-wise and pound-foolish procedure with regard to animals which have affected the veterinary surgeon's income adversely. Enterprise with regard to animal production has been a dead-letter. The thought and energy of the breeder and agriculturist have been centred on other things, temporarily considered to be more important and pressing. The view that it takes three or four years to bring animals to full profit seems to have been entirely lost sight of, and we fear that the idea that last year has been bad, but the *next* will be glorious, because we will make it so, has been far too prevalent. Again, many town and city vocations and industries have been seriously curtailed, and firms engaged in general trade and transport only exist in skeleton form or have vanished entirely. The tightening hand of scarcity has squeezed the milk and meat production and lessened its flow and size. It is true that there has been a less number of us to do the veterinary work, but we think it is also true that there has been less work for us to do.

With some discrimination in the future, and a broadening of the field of vision, there are regions that can be opened out and roads that can be extended which will be for the benefit of our country no less than ourselves. Both municipal and State positions for veterinary surgeons can be largely increased. Research into animal diseases is a pressing necessity, and good positions for our graduates will be furnished thereby. The general practitioner must trust to a revival of trade and enterprise, and he may well live in hope, although the hope may be somewhat long deferred. He will not flourish to-day or to-morrow, but he will not die in the workhouse.

The prospects of country practitioners would seem to be better than those of town and city men.

In the cities of New York State (where, by-the-by, they seem to keep better records of activities than we do here) there has been a big decline in practising veterinarians. In New York city there were 181 licensed veterinarians in 1909, and in 1917 only 104. In Brooklyn in 1909 there were 96, and in 1917 only 62. In Buffalo there were 31 in 1909 and in 1917 only 17. This is due chiefly to displacement of the horse by the motor car. The centre of veterinary activity, as pointed out by Dean Moore, is shifting from the towns and cities to the country, and the Dean astutely recognises that this calls for a more comprehensive course of instruction in the veterinary schools than has yet been given. We think much the same conditions apply in our towns and cities.

Here in this country some of our members have told us what wonderful work the tractors are doing, and they appear to take a rather gloomy view in some districts of veterinary prospects in country practice, but it will be criminal neglect of the worst type if there is not a great revival in animal breeding and a neglect which we think our countrymen will neither overlook nor allow. Agriculture has been promised due and earnest consideration in the period of reconstruction. It is true it appears the last on the programme list, but its importance is neither eclipsed nor overshadowed by any other item on the agenda, and we ought to know how to treat politicians who keep their promises, and also what to do with those who do not go all out and "over the top."

G. M.

THE FITNESS OF THINGS.

If an engineer was to apply for a vacant place as a stud groom, a doctor seek to fill a situation as a ship's captain, a lawyer to answer an advertisement for a lady's maid, they would probably be considered not quite right in the head, and their non-suitability for the job ought to be self-evident to the deciders. Bodies of men frequently do what single individuals would leave undone or do differently. They often ignore or only have hazy ideas as to the fitness of things. So we see men appointed to control things who have not a shade of a shadow or a shred of an idea of the value or difficulty of production of the commodity they control. Goodwill is the essence of bartering and trade between producer and consumer, and where knowledge and perception prevail things run smoothly, but where ignorance and dogmatism abound there is always room for a breakdown or an explosion. Veterinary surgeons have not been called upon to fill many recent vacant positions for which they are eminently fitted. There ought to be a veterinary surgeon on almost every food control committee, but how many do we find there? How many of us either are concerned with

horse demobilisation? How many laymen are giving expert advice with unblushing insouciance on animal matters? Do we make as much effort as we ought to do to put our claims before the appointers of the jacks of all trades who fill official positions and pose as authorities on matters about which they know nothing. Importunity on our part, and enlightenment as to suitability and adaptability on the part of the givers out of jobs, are two things greatly needed at present Reconstruction of thought on many things is quite as important as reconstruction of methods. Utility is one of the prime things to be kept in view.

A bit of the mind of the man who criticised the human frame thus needs to be evident. "We are made all wrong. What is the use of calves at the back of our legs if we get kicked on the shins? Look where our mouth is. It s always spilling things. It ought to be on top of our head and then we could put our breakfast under our hat and eat it when we were going to work."

Would that all men contemplating office had as much discernment as Mr. Justice Sargant shows in relating the following tale:—"A well-known artist friend of mine had a poodle that contracted a sore throat, and sent for a Harley Street specialist to attend to the dog. The doctor was none too pleased at the call, but examined the animal's throat, prescribed for it, and, after pocketing a large fee, went away.

"The next day he sent post haste for the artist, and the latter, with his pet in mind, dropped his work and rushed off to Harley Street.

"On his arrival the eminent specialist said gravely: 'How do you do, Sir? I wanted to see you about having my front door painted."

G. M.

DOCTORS AND DEMOBILISATION.

Priority Claim for Long Service.

The medical profession is apprehensive lest those of its members who gave up most, whose conditions of service were hardest, and who have served longest, will not be accorded the priority in demobilisation to which they are entitled.

"On the one side," says the *British Medical Journal*, "the military authorities are reluctant to let go the doctors whom they have; on the other the Insurance Commissioners are solicitous for the medical care of the insurance population. Between these two forces pulling different ways there seems to be some danger that the interests of the individual officer who quitted private practice in the first days of the war may be neglected. We should regard that as a breach of faith."

Original Communications.

THE WORK OF THE BRITISH ARMY VETERINARY CORPS AT THE FRONTS.*

By Major-General Sir FREDERICK SMITH, K.C.M.G., C.B., F.R.C.V.S.

Part I.

When invited to deliver an address on the Veterinary Service in War, I doubted its necessity, for the subject had already been dealt with by Captain Fairholme in 1915, by Lieutenant-Colonel Rainey, of the Army Veterinary Service, in 1917, and by Captain Galtrey of the Remount Service, in 1918. To Captains Fairholme and Galtrey my Corps is indebted for their appreciatory criticisms, while the public is under the obligation of receiving from their pens a picture of the veterinary care of animals in war which must have come as a revelation in humanity and organisation.

The popular conception of the Veterinary Service in war prior to 1914 was not very creditable to human intelligence. I well remember a scientific friend expressing surprise that any organisation for the care of sick and wounded animals in war was necessary or practicable; he had a notion that something might be done for them during peace, but that in the complex events associated with war nothing of a practical nature was possible, and the animals must be left to chance. Perhaps there were others of equal mental ability who thought the same, while it is certain that among the public generally the idea of any special organisation for the veterinary care of animals in war was scarcely contemplated. One of the objects of this paper is to show that the conservation of animal life in war is of paramount importance. It has not always been so regarded; up to and including the war in South Africa the history of the veterinary care of Army animals had been sad reading, a story of suffering, misery and losses which can only fittingly be described as appalling. Humanitarian, and perhaps financial, considerations are responsible for the change which has been wrought during the past sixteen years. I should not like it to be thought that the Veterinary Service was in any way responsible for this indifference. The veterinary reports furnished after every campaign for many years past dwelt upon the absence of all arrangements for the care of the sick, and the wastage resulting therefrom. They made suggestions for the future, and indicated the necessary organisation; but as a nation we are naturally slow at adopting new ideas, and intensely conservative, yet it is well known that disease and death are always more costly than health and efficiency.

We have, I am sure, to thank the factor of public opinion for the

* Paper read before the Royal Society of Arts, on December 11th, 1918.

great change which has been brought about. For the best part of a century the same powerful lever has been working in the interest of the soldier, whose conditions of life have changed beyond all recognition. If we wish to learn the lot of the soldier in war during the past and preceding centuries we have only to turn to the pages of Fortescue's "History of the British Army." How any men ever survived the absence of all organisation for their preservation and subsistence is little short of a wonder. Army animals have now had applied to them similar measures to those which have been found so successful and economical with men.

I have little doubt that there are many people who date the origin of the veterinary art from late in the nineteenth century, whereas, as a matter of fact, it is as old in the history of the world as our records go back. I propose, very briefly, to take you over the ground, not only with the object of showing the antiquity of the veterinary art, but also to indicate the important part played in its development during the early centuries of the Christian era by veterinarians who were associated with the Army.

The earliest extant works on the diseases and injuries of horses belong to the fourth century of our era, and were written by army veterinarians of the Byzantine or Eastern Roman Empire, the chief of whom was one Apsyrtus, veterinarian in the army of Constantine the Great. The fourth century was not, however, the real starting-point of veterinary knowledge; there is ample evidence to show that there were skilled men in the time of Ancient Greece. Xenophon wrote on the care and management of cavalry horses 800 years earlier than the time of Apsyrtus, and we know that his views are as true to-day as when written 2,400 years ago. Aristotle, who lived 150 years later than Xenophon, devoted the eighth book of his history of animals to a consideration of veterinary medicine; he wrote, of course, as a layman. The Romans, on the other hand, were not skilled in medicine or surgery; in fact, for five centuries the medical art was unknown in Rome; later they borrowed from Greece. If this was the condition of human practice, it is easy to understand the position of veterinary medicine. Varro, a soldier who flourished 36 B.C., and appears to have explored every branch of human activity, refers to the ancient Greek veterinarians as "Hippiatroi." He was evidently familiar with their work, of which, unfortunately, nothing remains. He himself wrote on the diseases of animals, and it is doubtless to such men that the Roman Army, even as early as the second century of our era, possessed an infirmary for sick animals known as a "Veterinarium." But Columella spoke of the "Veterinarius," or animal physician, in 42 B.C. The irritating word veterinary

is therefore extremely old ; it disappeared with the final collapse of the Western Roman Empire, and was not met with again until the year 1528, though it did not appear in England until the closing days of the eighteenth century.

Among the contemporaries of Apsyrtus was one Chiron, a man whose work on veterinary medicine has only come to light in recent years. Shortly after Apsyrtus there lived a lawyer and gifted veterinarian, by name Hierocles, fragments of whose letters survive, and of whose works on diseases I have been fortunate enough to find two previously unidentified manuscripts in the British Museum.

It was from inspirations obtained from these gifted men that Vegetius, the Western Roman General, who flourished about the middle of the fifth century, wrote his remarkable treatise on " The Veterinary Art." He was not only a soldier, but a man of letters. Vegetius stands out in bold relief in the Western Roman Empire ; he deplored the low state of the veterinary art in Italy, and tells us that the study of animal diseases is regarded as a mean and contemptible occupation. Though 1,500 years have passed since that was written, public opinion on this question has undergone very little change. The work of Vegetius may be read with interest to-day ; he is very modern in some of his views, such, for instance, as the absurdity of regarding outbreaks of disease as being evidence of Divine wrath ; he urges the public in these cases to place their faith in medical aid rather than in incantations and charms.

It is fortunate, amid the disruptive influences of 1,000 years, that the work of Vegetius has been spared, and was among the earliest books printed in Europe, being published in 1528. Two years later, what was left of the manuscripts of the Byzantine veterinary writers, *i.e.* Apsyrtus, Hierocles, and their many correspondents, was published in Paris under the orders of Francis I., the title then given to the collection being " The Hippiatrica." How these manuscripts got to Paris is unknown ; probably, with many others, they were brought back from Constantinople by the Crusaders. It is interesting to note that a copy of the fragmentary manuscripts of these early Byzantine veterinary authorities is regarded as one of the literary treasures of the world.

This rapid, and necessarily very incomplete outline will help to show you that the foundations of the veterinary art are not of recent growth, but belong to the history of the ancient world. As might be expected, army requirements stimulated an interest in the matter. It was precisely during the period of the fourth century that masses of cavalry were coming into existence, and largely replacing infantry in the line of battle. The growth of the cavalry arm, and the

development of veterinary medicine and surgery were not a mere coincidence.

I must not occupy your time by giving an account of the veterinary art from the Renaissance to the present day; but one important epoch in its history in this country cannot be passed over. In the last days of the eighteenth century—to be precise, 1793—a French refugee established a veterinary school in London, based on those then existing in France. Thus, for the first time in England, properly trained men for the veterinary care of horses were supplied. The opening of this school was welcomed by officers commanding mounted branches of the army. Troops had been decimated by contagious diseases, and the sole advisers were the ignorant farriers. Within three years of the London school opening, commissions in the army were given to its graduates. This was the beginning of the Army Veterinary Service, the development of which must occupy our attention for a few minutes, in order that its position at the present day may be explained.

At the end of the eighteenth century, and for many years afterwards, regiments were practically the private property of their colonels. It was they who engaged the necessary technical staff, such as surgeons and veterinary surgeons, and these officials, it is interesting to note, were actually remunerated by certain stoppages from the soldier's pay. The Government of those days starved the army in every way, and insisted on it being self-supporting.

The method of caring for the sick animals of regiments on service was very simple. If they were not too ill to walk, they were led along with the baggage; if too ill, they were left behind to look after themselves. Nor need we be surprised at this primitive arrangement, when much the same system was pursued towards the men. The long years of peace which followed Waterloo were not calculated to develop either the medical or veterinary branches of the army. Peace routine was simple; every regiment had its own separate accommodation for sick men and horses, and their own doctors and veterinary surgeons. The nurses, in both cases, were the untrained soldiers of the regiment.

The Crimean campaign revealed the impossibility of attempting the regimental treatment of the sick and injured. The lesson had to be learned that a sick man and horse is of no fighting value, a clog on mobility, and the sooner they are moved into hospitals away from their regiments, the better for both the regiment and the patients.

For years after the Crimean War, thinking minds in the Medical Service of the army were ever pressing forward a scheme by which the medical officers of the army were to be withdrawn from regiments,

converted into a homogeneous body with a subordinate technical staff under their own control, and hospitals under their own management and administration. Bitter and prolonged was the opposition to reforms of such obvious utility and humanity, but gradually each point was conceded, until the Army Medical Corps was born. I need not refer to its magnificent work, nor the extraordinary manner in which it has controlled disease. It has recently been shown that in previous wars, from ten to fifteen men have died of disease to one who has died at the hands of the enemy; in the present war, one man has died of disease to every ten whose death were caused in the field.

It is self-evident that a scheme suitable for sick and wounded soldiers was capable of being adapted to the requirements of sick army animals. The Veterinary Service urged that its scattered and impotent components should be formed into a single body under its own officers, and given facilities for dealing with disease and injury on an organised basis. This scheme has taken nearly forty years to accomplish, and the only qualification I possess for appearing before you to-day, is that I am the one survivor at present in active employment—though as a "dug-out"—who has witnessed the entire transformation, and, further, I have been privileged to assist in its construction.

It is a remarkable fact that the people who are most anxious for the suppression of disease are those whose financial interests would appear to suffer seriously by its obliteration. More than two thousand years ago Plato wrote that medicine was the science of health. The present position of preventive medicine in this country is alone due to the persistent hammering of the medical profession, which has resulted in an enormous improvement in the health of the nation, but much remains to be done. It may not be known to you that statistics have recently been published, which show that only one man out of every three in the prime of life is capable of being passed fit for service in the front line! This national reproach is far more difficult to deal with than unsoundness in horses, but even in this matter, which is under the direct control of the individual breeder, little but indifference has in the past been shown to the laws of heredity so far as they affect the question of disease or transmissibility of unsoundness. The serious prevalence of consumption among our dairy stock is another reproach, of which at present there is no indication of removal. Yet such is possible.

The fact is that the public does not appear to be seriously interested in the prevention of disease; far otherwise is it in the question of treatment; they love medicine, and especially nostrums, for which

they are cheerfully prepared to pay the Exchequer £300,000 a year in stamp duty alone! Similarly, the entire function of the veterinary profession, according to the public view, is the treatment of disease. I am anxious to remove this erroneous conception, and to impress upon you that its great office is prevention. From the date of the first Army Veterinary Service, in 1796, the campaign against disease has been going on. As we have seen, it was the appalling losses due to contagious diseases among troop horses which created the Service, and within a few years of its formation matters had improved beyond recognition.

Every step in the fight against disease has to be based on precise scientific knowledge; very occasionally a truth is obtained by accident, as, for example, the protection afforded against smallpox by inoculation with cowpox; but accidental discoveries are rare. It was the patient study of the mosquito, flea, louse and bed-bug which showed their connection with malaria, plague, trench-fever and typhus. It was the study of certain species of blood-sucking flies and ticks which revealed the true nature and origin of a series of plagues which still remain incurable, and are capable of destroying the whole human and animal life of a sub-continent.

I am endeavouring to show that the importance of veterinary hygiene and veterinary preventive medicine has been overlooked by the public. These play the largest part in the Army Veterinary Service, for the chief losses among animals in war is not due to battle casualties, but to disease and injury. Contagious diseases have to be guarded against by the careful inspection of all animals; their introduction into the Service has, if possible, to be prevented, and should they gain admission their early detection and obliteration is of paramount importance. In times of peace this is not difficult, but in war it is otherwise, for not only are the risks of infection much greater, but the facilities for proper inspection are necessarily infinitely less perfect. Moreover, there is the daily risk of fresh infectious material being introduced by the constant influx of new animals to replace wastage.

Injuries are controlled by a precise knowledge of how they are produced. Let me illustrate this point, which otherwise would appear to be a mere platitude. Sore backs, sore shoulders, head-rope galls and kicks from other animals, are among the prolific sources of injury in the field. The trained eye can recognise at a glance an ill-fitting saddle or collar; it can recognise a head-rope so fastened that it is bound to cause injury, and can prescribe means of restraint for kicking horses which considerably limit their activities. Knowledge of this kind is designated "horsemastership," and the man who possesses it

is a valuable asset to the State. He must also understand how animals should be fed, acquire an acquaintance with the various foods employed, and the elementary principles of nutrition. He must always be learning, for these questions are not so simple as might appear, and cannot be acquired by reading. An apprenticeship of five years under a good horsemaster is necessary in order to gain a working acquaintance with the subject. Two thousand four hundred years ago Xenophon wrote that the eye of the master makes the horse fat. This is an axiom in horsemastership, for there is nothing capable of taking the place of constant supervision. We must remember that when animals are tied up they cannot look after themselves.

It will be evident to you that horsemastership in the present war has left much to be desired, through the permissible ignorance of those in charge. Officers and men without the most elementary acquaintance with horses in civil life have found themselves responsible for the care and management of a strange and capricious animal. Among the many difficulties of the new Army there was none that it had to face greater than this; it is one in which information could not be imparted by any other means than that of practical experience. Nearly all the painful and frequently fatal diseases of the digestive system of the horse are due to errors in watering, feeding and work. The principles governing health and efficiency are hard and fast, there is no compromise, though under the conditions of active service much may have to be done which we know to be wrong in practice—military necessity knows no laws.

We must, however, leave the questions of the prevention of disease and injury and the promotion of health and efficiency in order to outline the subject of the methods of dealing with sick animals in war.

I am now about to tell you how 1,300 officers and 27,000 soldiers, exclusive of 6,000 coloured men, are employed as a corps in the various theatres of war in looking after questions of health and disease as affecting all classes of Army animals. Let me remind you that the horse is not the only animal in the Service. Though the public thinks in terms of horses, we must not forget that the mule bulks largely, while thousands of oxen and camels are employed in African, Egyptian and Arabian theatres of war: all these different animals come under the care of the Veterinary Service.

We will begin our study of the question by taking the smallest complete unit of all arms, *i.e.* the Division.

Every division of our Army is provided with a staff, consisting of officers, non-commissioned officers and men of the Royal Army Veterinary Corps. Each veterinary officer of the division has charge of a certain number of animals, and for the carrying out of his duties

is responsible to a senior officer, known as a Deputy Assistant-Director of Veterinary Services. This latter officer is in turn responsible to the Assistant-Director of Veterinary Services of the corps of which the division forms a part, while the corps officer is responsible to the Deputy Director of Veterinary Services of the Army to which it belongs. The Deputy Directors of armies are, in turn, subordinate to the Director of Veterinary Services at General Headquarters. This is the chain of administrative responsibility under which the whole veterinary machinery works, and by which its efforts are directed and co-ordinated. It is the mechanism by which the humblest animal in the force receives veterinary attention from the moment of its being ill or injured, which directs its steps to hospital, and finally returns it to duty. No distinction is made in the matter of solicitude or care between the transport mule and the officer's charger.

Every division possesses a special veterinary organisation known as a Mobile Veterinary Section, the function of which is to form a combined collecting station for the sick and a field veterinary hospital. It is composed of an officer, non-commissioned officers and men of the Royal Army Veterinary Corps, and is provided with its own transport for stores and equipment. Wherever the division goes its mobile veterinary section accompanies it. The advantage of bringing the sick of a division together for treatment is obvious, for not only is a sick animal a clog on the mobility of the battery or regiment to which it belongs, but there is no one to look after it except by depleting the fighting strength.

The cases sent to a mobile veterinary section are broadly of two kinds: those which will be fit again in a few days and those requiring prolonged treatment. The governing principle in working a mobile section is that it must evacuate its serious or prolonged cases, in order to continue to perform its function as a collecting station in the field. The location of the mobile section is known throughout the division, it flies a distinguishing flag, and at night distinctive coloured lanterns are displayed. In stationary warfare it is connected up by telephone with the headquarters of the division, and care is taken in selecting its site that suitable accommodation is provided. For example, it is no use locating a mobile veterinary section some distance from a water supply, or away from a main road.

In mobile warfare the section, in addition to receiving sick, has also to collect any animals abandoned by the division. There are always some which at the last moment are found unable to accompany their units, and these are left behind with the full knowledge that they will not be neglected. When a division is moving, its mobile veterinary

section is the last to march off, and time is thus given to collect waifs and strays, and make a final evacuation of those animals intended for hospital.

Every animal sent to a field veterinary section is accompanied by a form, which gives the name of the unit to which it belongs, the disease from which it is suffering, and a description of the animal for the purpose of identification. On admission this is checked, the diagnosis verified, and a serial number allotted, which is placed on a label tied to the head-collar. A special coloured label is also tied on embodying the ascertained facts regarding the cause of inefficiency, a white label being used for medical cases, green for surgical, red for contagious, and blue for casting. In addition each animal bears a stencil mark in paint on the quarter, showing the number of the mobile veterinary section to which it belongs.

A careful examination of all patients received by a veterinary section is of the utmost importance,for it is here that cases of contagious diseases may be caught in their earliest stages. If the system described is followed out, it is known at once to which unit of the division the animal belongs, and notification of the existence of contagious disease is sent it as a warning.

No more important duty exists than the early and thorough examination of the sick, otherwise cases of incurable and highly infectious diseases, such as glanders, will be sent back to the base, and mixed up on the way with unaffected horses. Great judgment is also required in deciding which of the ordinary cases may with advantage be retained for treatment, and which should go back to base hospitals. Every animal sent back unnecessarily is a loss to the division and a source of expense to the State.

INVESTIGATIONS ON SPECIFIC OPHTHALMIA, IN CONTINUATION OF THE OBSERVATIONS MADE WHILST IN THE ABATTOIR, PARIS (Dec. 7th, 1918).

By Captain THOS. DALLING, R.A.V.C.,
No. 2 Veterinary Hospital, Havre.

Whilst stationed at the Abattoir, Paris, a number of sections of Optic Nerves, from animals affected with specific Ophthalmia were made, with a view to ascertaining whether or not any structural changes could be observed.

During the microscopical examination of these sections, especially when using the 1/12 in. oil immersion objective, many distinctly stained bodies, resembling short bacilli, were noted lying in the lymphatic spaces between the nerve fibrilae. It occurred to me that these bodies may have some bearing on the disease, and I decided to investigate further. The bodies were present in practically all sections examined.

An animal suffering from Specific Ophthalmia in an acute stage was destroyed and the head was preserved. Careful dissection was done, and the Optic Nerves attached to the eyes divided at the Optic Chiasma. The nerves were then cut across about their middle, under absolutely sterile conditions, and smears of the nerve matter made. In these smears, the presence of an organism—referred to below as the "Nerve Bacillus"—was easily demonstrated mixed up with ordinary nerve matter. The nerves were again cut across with sterile precautions, and portions of the contents of the nerve were sown on various culture media. For three days nothing was observed in the culture tubes, but on the fourth day small greyish spots began to make their appearance along the tract of the needle. These subsequently proved to be pure cultures of the "Nerve Bacillus."

At once the question arose as to whether this case might not be one of an accidental infection of some sort, and arrangements were made with the Havre Butchers, to return heads of animals affected with Specific Ophthalmia, sent to them to be slaughtered for Food.

In all eight heads were returned, and in each case both eyes were affected with Ophthalmia, in a lesser or greater degree. Smears were made and culture tubes inoculated with material from each of the sixteen nerves as above, and in each case typical growths of the "Nerve Bacillus" were obtained. On one case only was an extra growth got, viz.:—a strong growing Staphylococcus Aureus. Cocci were also observed in this special case in smears made from the nerve.

The "Nerve Bacillus."

(The "Nerve Bacillus" is so called for want of a better name, or because of my ignorance of its already acknowledged name, if it has already been described.)

It appears really as a Cocci-bacillus with rounded ends, 1-2m. in length by .5-1m in breadth. Very often pairs are seen end-to-end. It is motile. It stains well with any of the aniline dyes, is not acid fast, but is strongly gram negative.

Growth.

It grows both aerobically and anaerobically, but best as an aerobe, and on practically all ordinary culture media. When grown under anaerobic conditions, the growth is less powerful and whiter in colour.

Agar.

On Agar at 37° C. the organism grows well. When an Agar tube is inoculated with material from an optic nerve, nothing whatever can be seen for about three days. On the fourth day, tiny whitish specks can be observed along the tract of the needle. These gradually increase in size and finally run together, making a greyish, moist,

mass along the line of the needle. Subcultures on Agar grow very well. In about 18 hours small white colonies are seen; they soon coalesce, forming a greyish line.

After several days' growth, the whole surface of the medium becomes coated with a bluish-grey, moist, viscid mass, which, as it gets older, turns darker in colour. On the addition of saline solution to such a tube the mass becomes silvery in appearance.

GELATIN.

(*a*) *Stab Culture.*—At 48 hours, at 21° C., a sub-culture made as a stab, shows tiny white spots along the track of the needle. The spots are larger towards the surface. These coalesce and form a greyish line. On the surface the growth is slightly broader than on the needle track, but not broad enough to be described as a "nail growth."

Liquefaction of the gelatin begins slowly about the fifth day, the gelatin, right across the tube, liquefying at the same time, and continuing down to the bottom of the needle track, where it stops. The gelatin at this stage has a peculiar appearance. Three distinct layers can be seen :—

(1) Cloudy yellowish liquid gelatin,
(2) A yellowish, floculent mass,
(3) Clear solid gelatin,

in that order. No splitting up of the gelatin is observed.

(*b*) *Plate Culture.*—In about 48 hours, small white specks are seen, which increase in size, many running together to form greyish masses. Liquefaction soon begins, and before long the plate becomes a mass of liquid gelatin, with greyish yellow masses floating on it.

Broth.—Sub-cultures on ordinary broth, grown at 37°C. in 36 hours, produce no result. Nothing can be seen. The medium gradually becomes cloudy and a slight opalescent scum forms on the surface. This scum falls through the medium and collects as a pale yellowish deposit on the bottom of the vessel. It never clears, and after about a week's growth, one finds a very cloudy medium, with no scum on the top, but with a thick yellowish deposit on the bottom of the vessel.

Solid Blood Serum.—Original and sub-cultures at 37°C. on serum, grow very slowly at first. Greyish blue colonies appear along the needle track, and remaining apart for several days, coalesce, forming a bluish-grey mass. One never sees the whole surface of the medium covered as an Agar. It takes nearly a week before the line becomes fully covered with growth.

Potato.—Whitish specks appear along the needle track. They gradually increase in size. Growth on potato is very slow, and one never sees a massive growth as on other media.

EXPERIMENTAL WORK WITH THE NERVE BACILLUS.

Numerous experiments have been made both on horses and on laboratory animals with various results.

1.—Two guinea-pigs, healthy as far as could be seen, were each given ·2 c.c.of a 48 hours' agar growth, emulsified with normal saline solution, intravenously. These animals never showed any signs of disease, and are now alive and healthy.

2.—Two rabbits were treated in exactly the same way as in experiment (1), and the results were similar, both animals being at the present moment alive and healthy.

3.—Rabbits and guinea-pigs were given ·5 c.c. broth culture of 48 hours' growth of the organism (*a*), hypodermically, and (*b*) intraperitoneally. Save for local abscesses, nothing noteworthy was seen, all animals being alive and healthy at the present moment.

4.—Two guinea-pigs were given ·5 *c.c. of a 7 days' growth of the organism in broth,* intrasaphenously. The animals at once went off their food, diarrhœa set in, and they became emaciated. On the third day in either case both eyes were closed, with a thick pus discharging from the inner canthus.

On examining the eyes, they were seen to be distinctly dull, and an intense conjunctivitis was present. One animal (A) died in four days, and the other (B) was destroyed. P.M's were made on both. The blood was not coagulated, but all internal ergans appeared normal. The eyes were carefully noted, and marked. Iritis existed in all four. In the left eye of (A) an Opacity of the Cornea was also seen. Sections, smears, and cultures were made from all four Optic Nerves, and a pure culture of the Nerve Bacillus, but the sections were not satisfactory.

5.—A saline emulsion of the organism was painted on the Cornea of several horses, but although kept under observation for two months, nothing resembling Specific Opthalmia was ever noted.

6.—Saline emulsion of the organism in varying quantities was injected into the Supra-orbital Fossa of several horses. In two animals local abscesses formed, but although all animals were examined daily for two months, nothing of importance was ever observed.

7.—Four horses each received 2 c.cs. of a saline emulsion of a 24 hours' growth of the organism on Agar, intrajugularly. For the first 24 hours the animals refused their food, and developed temperatures up to 103.5° Fah. They soon became normal again. In two cases a slight watery discharge was observed from both eyes, and conjunctivitis was present. This soon cleared up. In three weeks' time they each received 5 c.c. of a similar emulsion intrajugularly, and presented similar symptoms of a severer nature, which disappeared. In three weeks' time they now received each 10 c.c. of a ten days' old

broth culture, intrajugularly. This produced very marked symptoms. Three of the animals became dazed and staggered about at once. The respirations increased to 50-60 per minute, and they began to sweat. Severe colicky pains were noticed and violent diarrhoea began within ten minutes after infection. They all went down and lay stretched out for several hours, the pulse being full and fast. These symptoms gradually abated, and in the course of two days they were normal again. In all three cases a very acute conjunctivitis began within six hours after receiving the injections. All the eyes were closed up and felt very tense on pressure, with a watery discharge exuding. They remained in this state for twelve hours and then gradually opened up, but the conjunctivitis persisted for several days. The eyes were carefully examined in the dark whenever they opened up, and in each case the Iris was found paralysed and thickened, its shining appearance gone, and absolutely non-responsive to light. One of the animals has since become blind in the near eye from Opacity of the Vitreous Body, and another shows a distinct adhesion between the lens and the Iris.

The fourth animal never recovered from its dazed condition. It died in a few minutes after receiving its injection. Post-mortem revealed its heart valves thickened and its spleen twice the size of a normal spleen. Both eyes showed marked Iritis, with a very much thickened Iris, but no organism could be recovered from the Optic Nerve.

8.—Three horses received 2 c.c. Broth Culture of 48 hours' growth intrajugularly, without any marked result. Fourteen days later they each received 5 c.c. of Broth Culture of 10 days' growth. These injections produced exactly the same symptoms as in experiment (7) but of a more marked degree. All the animals subsequently recovered, but were several days off their feeds, running temperatures varying from 102°F. to 106°F. In each case Conjunctivitis is very marked and all animals now show paralysis of the Iris, which is thickened, except one. All eyes are very sensitive to light. If they are approached in the dark with a light it can be seen that their pupils are very small, and the size does not vary in the slightest no matter how the intensity of the light is varied, this showing that the Ciliary muscles are not responding. When the eyes are examined in the daylight, they are found to be tense, the Iris has lost its metallic lustre, and appears distinctly thickened, dull and wrinkled. In addition, the upper eyelid in each case is markedly puckered, and is being drawn up at the anterior corner, giving the eye a three-cornered appearance. From experiments (7 and (8) it would appear that if the "Nerve Bacillus" plays any part in the production of Specific

Ophthalmia, it acts best when it has been grown for a considerable length of time, *i.e.*, when an appreciable amount of toxin has been injected.

9.—Because of the results got in (7) and (8), an old culture was tried as an initial dose. Two horses each received *2 c.c. of a ten days old broth culture* of the organism, intrajugularly. Very marked toxic symptoms were observed. One animal (A) recovered in three days, but the other (B) took over a week to become normal and feed again. The symptoms were practically similar to those observed in experiment (8), but of a more severe degree. Animal (A) showed acute Conjunctivitis for several days, but this cleared, leaving the eyes with a thickened Iris, which did not respond to the different degrees of light.

Animal (B) showed acute Conjunctivitis, and when it cleared after three days, distinct adhesions were noted between the lens and the Iris in both eyes. No pupil existed at all in either eye, and now the Iris in both eyes is breaking down, parts floating about in the anterior chamber. Naturally the animal is blind in both eyes.

10.—Feeding experiments are being carried out on two horses. Both have received two doses of the "Nerve Bacillus" from a 10 *days old broth culture*, in the form of balls. They have received 10 and 15 c.c's, respectively. One animal shows distinct irritation in both eyes and photophobia is well marked. The experiments are still in progress.

11.—*Vaccine as a method of treatment.*—Acting in the supposition that the "Nerve Bacillus" may play some part in the causation of Specific Ophthalmia, a vaccine made from Agar cultures of the organism has been tried as a curative for the disease.

Five cases of acute Specific Ophthalmia were selected, all animals shewing Conjunctivitis and Iritis in both eyes, and all early cases. The vaccine was given as under, each c.c. containing 2,000 million organisms :—

	Amount of Vaccine Given.					
No.	1. c.c.	2. c.c.	3. c.c.	4. c.c.	5. c.c.	
1.	1/11/18.	5/11/18.	11/11/18.	16/11/18.	21/11/18.	Dates
2.	1/11/18.	5/11/18.	11/11/18.	16/11/18.	21/11/18.	of
3.	1/11/18.	5/11/18.	11/11/18.	18/11/18.	21/11/18.	injec-
4.	1/11/18.	5/11/18.	11/11/18.	16/11/18.	21/11/18.	tion.
5.	5/11/18.	11/11/18.	16/11/18.	21/11/18.		

A distinct improvement was noticed in each animal after the second dose. Animals 1, 2, and 4 continued to improve and now their eyes are absolutely normal and have been so for a month. Case 3 shews the left eye absolutely normal, but the right eye shows a thickened Iris,

which, however, is still responsive to light. Case 5 shows the left eye normal, but the right eye is blind from an Opacity of the Vitreous Body. In all probability the disease had affected the Posterior Chamber before treatment was begun.

From the above it will be observed that as far as I have gone Vaccine treatment is satisfactory, provided that the treatment is begun in the early stages of the disease.

12.—*Agglutination Tests.*—Numerous tests have been made to ascertain whether or not the serum of different horses has any agglutinative power on the "Nerve Bacillus."

The procedure adopted is as follows:—Blood is drawn from the jugular vein of an animal by means of a syringe. A "Mulford Anti-Streptococcic Serum" syringe answers this purpose well. The syringe, with its plunger, rod and needle is sterilised. The skin over the site of operation is also sterilised. The vein is raised, and the needle inserted, and the plunger pulled up. Blood at once fills the syringe. The rod and needle are detached, and a rubber cap placed over the narrow end of the syringe, which is carefully carried and placed in a dark place, upright. The serum rises to the top in about 18 hours, and can be drawn off with a glass pipette. A 24 hours' growth of the "Nerve Bacillus" is made into an emulsion, with 5 c.c.'s of ordinary tap water. Three watch glasses A, B, and C, and a pipette, fitted with a rubber nipple, are got ready. By means of the pipette, 9 drops of the emulsion are placed in A, 2 in B, and 4 in C, respectively. One drop of serum is placed in A, thus giving a dilution of 1–10. One drop of the mixture from A is placed in B, and 1 in C, thus giving dilutions of serum 1–30 and 1–50, in B and C respectively. Four narrow glass tubes are got ready and marked 1, 2, 3 and 4. Into 1 is sucked a certain amount of A, into 2 a similar amount of B, and into 3 a similar amount of C. Into 4 a similar amount of the emulsion is sucked to act as a control. The ends of all 4 tubes are sealed, and all are placed into the incubator, examinations being made every half-hour for several hours to note results.

The following are the results found:—

(i) Serum from horses which had received several doses of the organism at intervals intrajugularly—agglutination in all dilutions in ½ hour.

(ii) Serum from horses clinically affected with Specific Ophthalmia:—

Agglutination in 1–10 dilutions in ½ hour.

" " 1–30 "

" " 1–50 " complete in 2 hours.

(iii) Serum from horses which had had acute Ophthalmia, and which now were practically cured :—

Agglutination in 1–10 dilution in ½ hour.

„ „ 1–30 „

„ „ 1–50 „ complete in 2 hours.

(iv) Serum from horses which had had acute Ophthalmia, and which had been cured by vaccine :—

Agglutination in 1–10 dilution in ¾ hour.

„ „ 1–30 „

„ „ 1–50 „ complete in 2 hours.

(v) Serum from horses which had had Ophthalmia, and which were cured by injection of "914" :—

Agglutination in 1–10 dilution in ¼ hour.

„ „ 1–30 „

„ „ 1–50 „ complete in 1½ hours.

(vi) Serum from horses which had never shown any clinical symptoms of Ophthalmia, i.e., normal animals :—

No agglutination in any dilution.

From the above it would appear that animals affected with Specific Ophthalmia, and those cured, had developed in their blood agglutinine capable of acting on the "Nerve Bacillus." Such a statement would almost make one justified in saying that the "Nerve Bacillus," if not *the actual cause* of Specific Ophthalmia, was at least *one of the causes*, probably acting with others.

Deductions.—From the above series of experiments, one may deduce that the "Nerve Bacillus" plays some important part in the production of Specific Ophthalmia, and that it acts through the blood stream. Because young cultures have practically no effect, and old growing cultures have, it would appear reasonable to assume that the organism must be present in considerable numbers before any evil effects are seen. Again, because a second dose of culture produces an increased severity of symptoms, it is possible to deduce that the organisms or their toxin accumulates in the blood stream. It would appear possible to use the agglutinative test to ascertain whether an animal is actually suffering from Ophthalmia or not, and also to determine whether it has had an attack at a recent date. Such a method of testing would be valuable because of the recurrent nature of the disease, and in any case of doubt.

Further Work.—Experiments are still in progress. The most important of these are (i) to ascertain if the "Nerve Bacillus" has already been described (ii) to find whether the toxin alone produces the symptoms, or whether the organism must also be present (iii) to find how the organism enters the blood stream, and whether it

becomes localised in any particular organ, (iv) to find whether the agglutinative power of the serum of affected and cured animals will agglutinate in any lower degrees of dilution, and (v) whether the period during which an animal is free from the disease can be determined by means of the agglutination test, etc.

Reports will be issued as experiments are made.

A METHOD OF ENUCLEATING THE EYE.

By Captain A. SAVAGE,
Canadian Army Veterinary Corps.

The object of the technique here outlined is the removal of the globe of the eye and its attachment within the orbit, as well as the whole of the conjunctival membrane. As a result it aims at leaving the orbit lined by the inverted lids joined together at their margins.

Preparation.

The animal is cast on its side, affected eye uppermost, and placed completely under chloroform. While awaiting the profoundest degree of anæsthesia, the operator mechanically cleanses the conjunctival sac with cotton wool, and thoroughly irrigates it with a warm saturated solution of boric acid in water.

Technique.

(1) *Sub-conjunctival Injection of Adrenaline.*—For this purpose a 1:5,000 solution adrenaline hydrochloride is used. It is injected by means of a suitable syringe (5 c.c. Record) beneath the conjunctiva of both lids at several points along their margins, in such quantity as to practically float the palpebral portion of the membrane away from all its attachments except over the membrana nictitans and along the ciliary borders. This process greatly facilitates its removal, and renders hæmorrhage negligible.

(2) *Dissection of the Conjunctiva.*—One eyelid is grasped midway along its border by a pair of fixation or other small forceps and partially everted. An incision is then made along its margin immediately behind the line of the lashes. An assistant holds the first forceps while, with the aid of a second pair and his scalpel, the operator dissects the conjunctiva away from the lid as far as its reflection over the globe of the eye. This is repeated on the other lid. Proper execution of the preceding step makes this very easy.

(3) *Removal of the Globe.*—Artery forceps are now applied to the nictitans, the membrane removed from the inner canthus and that from both lids. These four are brought together in one hand while, with curved 6-in. scissors, the extrinsic muscles of the globe and optic nerve are sought and cut; the base of the nictitans is also freed by

a stroke of the scissors. The globe, conjunctiva, and nictitans are now removed *en masse*. Hæmorrhage from the retinal artery is controlled by packing the cavity with cotton. Chloroform can usually be dispensed with at this stage.

(4) *Treatment of the Cavity.*—If the lachrymal gland has not come away with the globe it must be dissected out separately. The fatty tissue within the orbital sheath is removed with bow forceps and scissors; finally the lashes are trimmed off. The socket is now flushed with boric acid solution and loosely packed with gauze. It is important to avoid packing too tightly, but to allow for subsequent swelling of both the gauze and lids. This done, the lids are greased on their under surfaces with vaseline introduced on the handle of a scalpel, and then brought into apposition. The vaseline is of assistance in rendering the first dressing less painful than it would otherwise be. Providing the gauze has been properly inserted, suturing the lids is unnecessary. In the summer months the liberal use of 2 per cent. carbolic vaseline on the external parts prevents the animal being annoyed by flies.

(5) *After-care.*—Rubbing or injuring the seat of operation can be obviated by the use of pillar reins for the first few days. Dressing the wound begins in 48 hours, and is always a painful procedure on the first occasion. It is not often necessary to renew the packing unless one of the lids shows signs of inverting unduly. The writer favours 2 per cent. saline as an irrigation used twice daily for the first week or so—once daily as the healing progresses faster. Healing requires from four to six weeks, and has occurred uneventfully in the dozen cases thus treated. Needless to say, this method is not appropriate for cases to which the subsequent fitting of an artificial eye is intended.

The late Captain Routledge, A.V.C., introduced a method which consists of the excision of the cornea at its meeting with the sclerotic. This allows the contents of the eye to escape. The membrana nictitans is extirpated. Both lids are shortened by the ordinary method to prevent entropiun.

The eye heals in about 21 days. There is left a good stump which supports the lids. The background is black, thus calling comparatively little attention to the condition.

HÆMATOMA OF THE NECK.

By Captain A. GOFTON, F.R.C.V.S., R.A.V.C.

This condition, the result of bites, has been of common occurrence in France amongst the horses of the British Army. It is usually located in the lower third of the neck, and not infrequently encroaches in some

degree on the seat of the collar. Occasionally a hæmatoma is present on each side of the neck. It is more common in mares than horses.

Only a relatively small subcutaneous hæmorrhage follows the causal injury, but a free effusion of serous fluid quickly takes place, producing in a few hours a fluctuating swelling whose size varies within wide limits; it may easily be covered with one hand, or it may have a surface area equal to a square foot or more.

Most cases have been in existence for some time before arrival at the base hospitals. The majority have been incised, and a purulent discharge, frequently sour or slightly fœtid, escapes from the wound; the minority have remained unopened, and the contained fluids have been partially or almost completely absorbed. In either case the skin of the part is materially thickened and more or less wrinkled, producing an unsightly tumour on the side of the neck. The interior of the swelling presents a dense smooth lining which bears the closest possible resemblance to a mucous membrane, and between whose opposed surfaces union never takes place.

In a small number of cases free incision of the swelling throughout its whole length, if carried out within a few hours of receipt of the injury, will be followed by healing. A slight permanent thickening will remain to mark the site of the scar, but this result is only obtained with small hæmatomata handled before the development of the mucous-like lining, and they constitute an almost negligible proportion of the cases encountered.

The aspiration of the fluid from the unopened swellings, followed or not by the injection of irritants, does not give uniformly satisfactory results. Simple aspiration is always followed by refilling. The injection of irritants, provided their distribution over the whole of the interior is ensured, may destroy the membranous lining, but whether the swelling be subsequently incised or not success is only obtained with a limited number of the smaller hæmatomata, and their sites remain permanently marked by a dense thickening of the skin.

The radical method of treatment was referred to by Capt. Hamilton Kirk, A. V.C., in a note in the *Veterinary Record* of Oct. 19th, 1918, under the title of "Bacterial Infection of Wounds in France." This consists in complete excision of the whole of the tissues involved. As a rule the adoption of this procedure at the outset effects considerable economy in the time required for the recovery of what is inevitably a more or less protracted case. Briefly the procedure is as follows:—The outline of the hæmatoma, which is often irregular, is mapped out, and an island of skin is isolated by following the outline with a scalpel. The edges are then raised and the whole mass dissected away from the deep fascia of the neck, to which it is superimposed. With a little experience

this is easily accomplished without opening the interior of the hæmatoma on the one hand or injuring the deep fascia of the neck on the other. Rigid adherence to the outline is, however, inadvisable. A more or less circular wound or an irregular wound with rounded corners leaves a scar, with considerable puckering of the skin. By extending the incisions through the skin slightly a somewhat triangular wound is easily produced in the excision of a rounded mass of morbid tissue. Similarly, rounded corners may be prolonged to a triangular point. In this way clean linear scars result, and the process of suturing is facilitated. At the same time too much emphasis cannot be placed on the necessity of conserving as much of the healthy skin as is possible, consistent with the desired results.

It is only rarely that the whole of the wound can be closed, but wherever the edges can be brought into apposition sutures should be inserted. For example, in a triangular wound three sets of sutures may be employed, one at each point of the triangle, the suturing being continued as far as the skin is able to support, without cutting, the strain necessary to effect apposition. In this way the raw surface may be reduced from twenty-five to seventy-five per cent. or more, and it is obvious that economy in time will be effected in direct proportion to the extent to which the edges can be approximated and union secured.

To obtain satisfactory results the sutures must be inserted through the connective tissue of the wound, that is to say, neither needle nor suture should become visible between the point of entering the skin on the one side and the point of emergence on the other side of the wound. It is sometimes an advantage to employ one or more reinforcing sutures. By this means connective tissue as well as skin are brought into apposition and maintained there. A firm union results and the underlying cavity which results from simply pulling together the edges of the skin does not exist as a source of later trouble. Plaited horsehair makes the most satisfactory suture. Silk sutures quickly cut out, largely owing to sepsis along the course of the stitch consequent on the capillary properties of the silk.

After operation the animal is placed on pillar reins for ten to fourteen days. Success in effecting an early union depends in no small degree on the methods of dressing employed during this period. A clot of blood, which is a valuable protective, invariably buries the sutures. It should not be touched. If suppuration occurs the clot becomes raised or partially detached at the infected points, from which it should be removed, the pus should be pressed out gently and the parts swabbed and dried daily with an absorbent pad wrung out of an antiseptic solution. Washing should not be allowed. At the end of a fortnight

any remnants of the clot which may remain attached and the sutures should be removed. Those portions of the wound over which it has not been possible to bring the edges of the skin into apposition are treated on similar lines. A good deal of serum exudes and detaches within the first forty-eight hours, the clot remaining after operation. The detached clot is removed with forceps, and the raw surface swabbed and dried as before. It may then be dusted with a dry powder consisting of boracic acid, to which a small proportion of alum or biniodide of mercury has been added.

The procedure of suturing detailed above is often tedious, and it requires the exercise of judgment in estimating the extent to which the skin can support the strain of the sutures, but the results obtained, even after suppuration along the course of several sutures, are sufficient recompense for the time and trouble entailed. Disappointment may, however, be encountered at the outset of the procedure. A horse will sometimes throw his head about violently whilst recovering from the anæsthetic, and may break away the whole of the sutures. Once this has occurred a second set of sutures, more frequently than not, meets the same unfortunate fate, and nothing remains but to leave the whole wound open and to treat it on the lines indicated.

FOWL CHOLERA.

By HENRY B. EVE, M.R.C.V.S.,
Folkestone.

Subjects.—Variety of breeds, some pedigree utility strains, others common barndoor fowls, all obviously affected more or less when seen.

Symptoms.—The onset of the disease was sudden; client noticed the birds, as he termed it, squirting, and the excrement passed had an offensive odour and adhered to the feathers about the *vent*, staining it whitish yellow to greenish or brownish colour. Loss of appetite, great prostration, staring feathers. The birds moped, or sat around with tails and heads down, combs dark coloured, swaying gait, trembling, extreme thirst and severe diarrhœa, high fever, and rapid emaciation present.

Post-mortem.—Liver enlarged, dark-coloured, and tears easily. The intestines were congested and contained a frothy material. Hæmorrhagic enteritis. Spleen enlarged. Small (petechiæ) present on heart and coverings (pericardium). Epicardium, kidneys dark and enlarged. Blood does *not* coagulate readily.

Owner found dead birds in the nests, which made him think someone had poisoned them.

Diagnosis.—Fowl cholera, after post-mortem.

Prognosis.—Unfavourable.

Treatment.—All the sick birds were removed from the nest, and dead ones cremated. The hen-houses and nests were cleaned with McClintock's Germicidal Soap and sprayed with limewash and carbolic acid. The houses and perches were creosoted and fumigated with sulphur and formaldehyde.

Medicinal Treatment.—

Zinc Sulpho. Carb.	grs. 15
Sodium „	grs. vii
H.G. Bichlorid	grs. vi
Acid Citric.	grs. iii

M. haust.

Sig.—This was dissolved in a gallon of water and given to the birds in place of drinking water at troughs, which were scrupulously cleaned.

Diet.—Sour milk, dry food, containing powdered charcoal; no hot-mash food allowed.

Hygiene.—The birds were fed out of troughs previously disinfected, and *not off* the ground. The yard was disinfected daily with Jeyes' Fluid and covered with fine wood turnings, which were afterwards burnt along with excrement.

TETANUS OF A COW FOLLOWING RETENTION OF THE PLACENTA.

By E. MORGAN, M.R.C.V.S., D.V.H.,
Puerto Cabello.

History.—A criolla cow which had calved a strong, healthy calf at the expected time. The owner was a carter—I mention his vocation because I consider it might have some connection with the cause of this particular case. He called to see me one day, saying that his cow had calved about twelve days previously, that part of the cleansing was still retained, and that the animal was off her feed since the day before, but previous to that she was eating well. He asked if I would give him a cleansing drink for the cow. Also he informed me that on various occasions he had removed parts of the cleansing. I gave him a drench whose basis was mag. sulph., as I understood that the cow required some aperient medicine. The following day I met the owner, who informed me that the cow was somewhat worse, and that he found it impossible to administer the medicine, as they could not open the mouth of the cow, in spite of several attempts, and that she was unable to drink, although appearing at times to be anxious to do so. On hearing this I questioned him more minutely than before, as it seemed strange that retention of the placenta caused such hindrance to the

animal. I arranged to go and see the cow the following day, as I could glean but little information which would enlighten me on the case. Next morning, early, while I happened to be standing or the balcony in front of the office, I could see a cow in the distance coming along the street towards me, being led by two dames. The movements called to mind a bovine animal affected with "Sturdy," or "Gid," yet there was some particular difference, inasmuch as the tail now and again was held up, and sideways, also the limbs were not bent at the joints, but moved in a stiff manner. Upon closer examination I found that the animal was slightly tympanitic, and on attempting to approach her convulsions or spasms came on, and then she would move round the length of the rope. I eventually managed to lay my hand on the body, which I felt moist with perspiration, although imperceptible to the eye. The muscles of the jaws and neck were tense; the jaws completely fixed; the muscles of the limbs were quite rigid. I raised the head upwards, and immediately the eyeballs were retracted, with protrusion of the jaw, or *membrana nictitans*. This took place as well when each spasm would appear, and the head was extended, as well as the characteristic movements of the tail upwards and sideways. The muscles of the extremities were more rigid than those of the abdominal wall.

Diagnosis.—I informed the owner that the cow had tetanus, and that he should have kept her quiet instead of parading the animal through the town, and to take her home if possible, etc., etc.; also that the outlook was not very bright. When I told him this he quoted many cases of mules which were cured by rubbing the region of the jaws with turpentine and the body with fish-oil, and asked, "Would I have any objection to let him try this treatment until next day?" Knowing the Venezuelan character fairly well by this time, and whether I said "Yes" or "No" he would all the same carry out his own treatment, also, seeing that he considered tetanus was a mild and curable disease, I answered decidedly "Yes; try."

Next morning the owner came to see me with a smile on his face, saying that the cow had managed, but with great difficulty, to sip two large bucketfuls of water just before he left. He went back home, and again returned in the afternoon to inform me that the cow had dropped down dead after drinking the water, and that prior to dropping down she had swollen "like a toad does at the approach of a steam-roller." He had also made—he thought so—a very careful post-mortem examination, but all that he found abnormal was in the uterus and vagina, where there was a quantity of sanguino-purulent fœtid matter; also that the udder contained a great quantity of milk.

Remarks.—This man—the owner—during this period was carting surface earth from a field near by, so as to make a garden. He told me that almost every day he was attempting to remove the cleansing, and that he only used a little grease on his hands, without any antiseptics whatever. Needless to say, he never attempted to wash his hands prior to manipulating the placenta inside the vagina. I have no doubt in my own mind that in the first place tetanus in this cow was due to the retention of the placenta, but whether the germs gained entrance by means of the carter's hands, which is most probable, or were introduced from other sources, cannot be definitely stated.

Tetanus is most prevalent amongst horses and mules in Venezuela, but this is the first case I have yet witnessed amongst cattle. Again, if we take the animals in general, this channel of infection is not considered a very common one for the tetanus germs to enter.

This animal, by drinking a large quantity of water, caused tympanitis, and some of the liquid might have entered the trachea as well, as the animal was unable to regulate its movements; undoubtedly this water hurried matters to an abrupt ending.

It only stands to reason that tetanus in ruminants is more serious even than in other animals, on account of the mechanism of rumination being thrown out of gear, with bad results.

Should I again be called to see a case in a bovine I think it would be wise to make use of the trocar and canula; by doing so it would relieve the rumen of the accumulated gas, and therefore relieve pressure on several of the most vital internal organs. Also medicine might be administered through the canula into the rumen; so this simple operation would answer more than one purpose. While I was an assistant with Mr. Caulton Reeks, we were often called to attend cattle "blown" after engorging themselves on the potato-heap, and as fermentation goes on for a long time in such cases, we used a large-sized trocar and canula to evacuate the semi-liquid gas, and at the same time administered medicine as antidotes through the canula. It is a very easy way and safe—no need to struggle with a half-choked animal—also the medicine goes home directly and without spilling it on the ground.

Translations.

IS APHODIUS OBSCURUS, FABR., THE INTERMEDIATE HOST OF CITTOTÆNIA MARMOTÆ, BRAUN?

A CONTRIBUTION TO THE DEVELOPMENT OF THE CESTODE FAMILY OF ANOPLOCEPHALIDÆ (TAPEWORM).

By B. GALLI VALERIO,

Of the Institute of Parasitology and Hygiene of the University of Lausanne.

THE development of the Cestode family of Anoplocephalidæ, which is so important in connection with our domestic and working animals, has hitherto remained quite in the dark.

According to C. Curtice, young *tæniæ* of this family are armed. He found in the intestine of *Lepus sylvaticus* young Anoplocephalidæ which bore 80 to 90 hooks. Douthitt has made some experiments in order to discover the intermediate host of the Anoplocephalidæ of *Geomys bursarius*. With this object in view, he let *G. bursarius* eat a locust (*Ceutophilus*), but without success. Douthitt is convinced that the intermediate hosts of Anoplocephalidæ are not insects that live on grass.

FIG. 1.

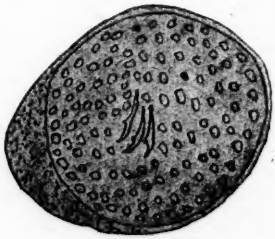

FIG. 2.

On September 14, 1917, I found by a marmot's hole a quantity of excrement containing many segments of the *Cittotænia marmotæ*, Braun. Examined microscopically, this excrement also showed many eggs of *Cittotænia*. A small beetle lived in this excrement. According to Prof. Bugnion, to whom I am greatly indebted, this beetle is the *Aphodius obscurus*, Fabr., a rather frequent species on the Swiss and Austrian Alps, which lives in cattle-dung. In one of these beetles, which had lived up till October 2nd in the marmot's excrement, I found in the abdominal cavity a small body which I consider was an undeveloped *cysticercus*. It was somewhat oval, 72×60 microns in size (Fig. 2), also somewhat larger than an egg of *C. marmotæ* (51×48 microns, Fig. 1), and possessed a double-contoured membrane.

The protoplasm contained many little chalky bodies, and in the middle three pairs of hooks. The pear-shaped apparatus of the embryo had entirely disappeared. The *cysticercus* still showed at one end

a remnant of granulated protoplasm of the egg. Doubtless this small body is none other than a not quite fully developed *cysticercus*. But is it the *cysticercus* of *C. marmotæ*? I find this to be very probable, because this small body, as the figures show, is very similar to the egg of this *tænia*, and because *Aphodius obscurus* is very probably a beetle which lives normally in the marmot's excrement, and only accommodates itself to cattle-dung.

If the small body which I have described in *A. obscurus* is really the *cysticercus* of *C. marmotæ, then it is very desirable to make a close examination of similar beetles for forms of other Anoplocephalidæ.*

REFERENCES.

Railliet. "Treatise of Medical and Agricultural Zoology," 2nd edition. Paris, 1895, p. 268.

"Studies on the Cestode Family Anoplocephalidæ." Urbana. 1915. – *Swiss Veterinary Journal.*

[The field of investigation here indicated is worthy of exploration by our scientists. There is much in the life history of many of the verminous parasites in our domesticated animals that is quite a blank to us. Unless insects bother animals or mankind they are too apt to be overlooked as agents in the spread of parasitism or disease.—G.M.]

DEPRAVITIES OF TASTE IN TROOP HORSES.

BY VETERINARY ASSISTANT MAJOR V. ROBIN,
Of the Toulouse Veterinary School.

LITTLE has been written about this matter, and only two short references have come under my notice—one by Valade in *Recueil de méd. vét.* and the other an analysis of an article by Hancock, in this Journal.

ETIOLOGY.—The usual rations of horses on campaign are estimated so as to contain sufficient nutritive principles for the maintenance of horses submitted to moderate work. In spite of successive reductions imposed by necessity it does not appear—theoretically, at least—to be deficient; it is undeniable that when the work is well set out the animals (at least in actual warfare) have daily exertion much inferior to that required in agriculture and industry. Besides, in well-managed effectives this work is sufficient to keep the horses in a very satisfactory condition.

But the quantity of hay which enters into the composition of the ration (3 kilos at the maximum) is too small for the digestive capacity of our draft horses, accustomed before requisition to a bulk of food three or four times as large. This insufficiency of ballast, unfavourable to an integral using out of the ration, leaves in the subjects a

permanent sensation of unappeased hunger. The sudden pang of hunger is shown at the moment of distribution of food by a keen excitement which causes astonishment in the observer. Besides, it is a fact which interests us here that horses during the leisure of bivouacs and the intervals between feeds seek to satisfy their appetite by tasting anything within their reach.

Tendency to imitate a neighbour, individual fancies, long periods of idleness on the rope, finally cold temperatures which increase organic waste, and as a result nutritive needs, seem to exasperate and make more apparent this sensation of hunger, which is shown according to circumstances by various manifestations.

We do not agree with the term *pica* as used by Hancock. The animals have not, as in the *pica* of ruminants, an exclusive predilection for all sorts of food. These are only ingested as a supplement to the normal ration, which is always preferred; and if one comes to increase the volume of the repast for a few successive days the quest for abnormal substances ceases immediately.

This pseudo-*pica* seems to necessitate a certain education for its production. I have only seen it appear in the effectives of my group at the fourth month of the campaign—at first in isolated individuals, and then progressively in almost all the subjects. An agricultural horse which needed daily medical care when put in the ranks and given the regular ration for a month did not contract the habit in spite of the example of his neighbours.

SYMPTOMS.—According to opportunity, the material ingested by the subjects varies.

I. *Ingestion of wood and bark.*—During the first year of the campaign it was usual to put horses in rows along hedge sides or lines of trees. Extensive damage was done in this way. At the end of a few days, or even hours, hedges were literally eaten up and trees stripped of their bark up to two metres from the ground, and sometimes even notched more or less deeply. Passing by the old bivouac places behind the front one can see numerous ranks of trees thus mutilated. I ought to say that these practices, which entail considerable damage, have now for a long time been strictly forbidden. When the horses are housed they attack the posts of the shed, mangers, racks, or partitions. It is necessary to cover all woodwork within reach with metallic stuff; without this precaution I have seen posts ten centimetres in diameter completely gnawed through in a day, and the shelter suddenly crumble to pieces on the occupants.

All arborial essences are equally relished; the resinous ones alone are discarded, although some subjects, chiefly gluttons, attack these for lack of something better.

II. *Ingestion of earth.*—After a meal the horses for hours look for oats fallen from the nosebag or trough. One patient observation showed the subject taking real pleasure in licking the earth and eating bits of it. The assiduous eating of earth is quite rare, however; it was hardly ever seen even when hay failed completely, or in artillery horses, where feeding difficulties are considerable. During the winter of 1914–1915 an instruction from the Principal Veterinary Surgeon read: "Army corps draws the attention of veterinary surgeons to the serious accidents due to geophagy. In these subjects, dead of emaciation, the intestine was found at the autopsy literally coated with a plastering of clayey earth."

III. *Ingestion of litter and dung.*—The first-named is the commoner. Almost every horse does this thoroughly. After having ingested the litter, beginning with the least soiled portion, they eat all the dung within reach; one sees individual horses even make desperate efforts to reach the dung of their neighbours.

IV. *Ingestion of sand.*—This habit, already noted before the war in troop-horses bivouacked on sandy camps, has often been observed during the campaign. During the summer of 1917, in the region of the Aisne, while in charge of 600 horses, I had more than 80 cases of colic due to the ingestion of sand at the bivouac place. Although it is difficult to surprise the horses in the act of deliberately taking sand, one must admit that the small quantity mixed with the forage at the moment of its distribution is not the sole cause; in the effectives, where one takes care to put a muzzle on the horses directly after a meal, colic disappears almost entirely.

V. *Ingestion of coal.*—In this connection an interesting case of depraved taste occurred in the mining region of Pas de Calais. At the end of October horses of my advance troop were tethered at the post of an enormous coal-dust heap which sheltered them from the north wind and obscured them from the view of the enemy. In the first hours a few subjects curiously crunched some bits of coal; the impression gathered was doubtless favourable, and was communicated to neighbours, for at the end of the first day all the lot were eating this strange food. On the morrow I was called to some ten cases of colic of variable gravity. The military position did not allow of removal of the horses for a week, and during this time several deaths occurred. After suppression of the cause, things gradually returned to normal.

(*To be continued.*)

Biography.

PROFESSOR GUIDO FINZI.

PROFESSOR FINZI, whose photograph is reproduced in the present number of the *Veterinary Journal*, is one of our most prominent Italian veterinary allies, and his services have been called into requisition for bacteriological research amongstthe horses and mules of the Italian Army during the present great European War.

At the present moment he holds the military rank of Veterinary Lieutenant-Colonel, and is the Director of the Military Laboratory for the preparation of various sera, and also of a veterinary laboratory which has been fitted up in the war area for the purpose of making researches into certain methods for the eradication and prevention of glanders. In the bacteriological study of this disease, as also of that of tuberculosis in animals, he is universally recognised as an authority whose opinion carries great weight, and a large number of articles have come from his pen,

For some time he studied at, Pasteur Institute, Paris, and also at the Veterinary College of Alfort, collaborating with Professor Vallée in several articles dealing with the use of certain sera and with the question of tuberculosis.

On Coccidiosis and Spirochetes and various internal parasites he has written frequently, but probably for researches into glanders and tuberculosis his name is known the best amongst his foreign confrères, and it is certain that at the next International Congress he will be welcomed as one of the most earnest and eminent contributors.

Dr. Finzi has been elected corresponding member of several learned societies, amongst which are the " Société de Pathologie Companie," the " Société de Pathologie Exotique " of Paris, and the King of Italy has recently recognised his merit by conferring upon him (1918) the distinguished Order of Cavalier of the Crown of Italy.

Through him this is a great honour to the veterinary profession of Italy, and it is to be hoped that he will live long to enjoy it. It is also worthy of note that his latest promotion in rank to Lieutenant-Colonel was given by His Excellency the Minister of War " for merit " and for good work done during the campaign.

Personal.

CONGRATULATIONS to General Fray, the Chief Veterinary Inspector of the French Veterinary Service, on the award of Commander of St. Michael and St. George.

General Fray has done much to cement friendship and forward good work between his confrères in the British and French Veterinary Services, and the news of the honour is one which will be received with much pleasure by all who have met him in France.

CONGRATULATIONS to Major Stothert and Capt. Greene, of the R.A.V.C., on the award to each of them of the "Croce de Guerra" of Italy for the part they played in the recent great advance and victory on the Italian Front. Major Stothert is A.D.V.S. of the 48th Division, and is one of the most popular and best-known officers in the Division; and Captain Green, equally well esteemed, is the Officer Commanding the 1/1 South Midland Veterinary Mobile Section.

CONGRATULATIONS to Professor Dr. Finzi, Professor of Bacteriology in the Royal Veterinary School of Turin, on his recent special promotion to Lieutenant-Colonel "for exceptional merit shown in the War area." A photograph and biography of Lieut.-Col. Finzi appear in another column.

CONGRATULATIONS to Capt. Grassi, who, on account of his tact and linguistic abilities, was selected as the Italian Veterinary liason officer, on the award of the Military Cross.

Correspondence.

"COMMON DISEASES OF PIGS AND THEIR DIAGNOSIS."

To the Editor of THE VETERINARY JOURNAL.

SIR,—I was interested in reading, in your most useful Journal, a review of my book on "Common Diseases of Pigs and their Diagnosis." It is very gratifying to know that you recommend it, but in one or two instances your references are apt to mislead your readers. May I, therefore, ask you to kindly insert the following in your next issue?

In reply to your query for the names of counties where a castrator is required by the authorities to keep a record of his pig castrations, I quote the following extract from Swine Fever Order (No. 8,184), 2nd September, 1911, which is referred to on page 20 of the book reviewed.

Extract:—"Every castrator of swine *shall* keep a register in which there shall be correctly entered the following particulars, that is to say—

"(i) the date of each castration;

"(ii) the name and address of the owner, or person in charge of the swine; and

"(iii) the number and description of swine castrated."

"Castrator" means a person who castrates for reward.

With regard to non-disinfection of infected styes of premises, you express doubt as to its accuracy. It was one of the findings of the Departmental Committee appointed by the Board of Agriculture to inquire into Swine Fever, and in support of my reference the following paragraph is extracted from "Recommendations," page iv, final report, 12th August, 1915, viz. :—

"That, in view of the experimental results above referred to, the lapse of a short period of time may be relied upon for disinfection of premises, and should be regarded as preferable to chemical disinfection in the case of large quantities of manure and of premises not readily capable of being disinfected by artificial means."

I would add this has been put into operation in the field, with satisfactory results so far.—Believe me, Yours sincerely,

Cleeve Cottage, Croydon Road, Beddington, Surrey, 14th Dec., 1918. ERNEST PEACEY.

Reviews.

BAILLIÈRE'S ATLAS OF THE HORSE, ITS ANATOMY AND PHYSIOLOGY.—By O. Charnock Bradley, M.D., D.Sc., M.R.C.V.S., Principal of the Royal (Dick) Veterinary College, Edinburgh, and T. G. Browne, M.R.C.V.S., Professor of Anatomy, Royal Veterinary College, Dublin. With original plates by George Dupuy, M.D. Size 9½ by 17½, pp. 38. Five coloured, eight plain plates. Price 7s. 6d. net. Publishers: Baillière, Tindall and Cox, 8, Henrietta Street, London, W.C.2.

The greater part of this work is taken up in illustrating and describing the anatomy of the horse, but there is a very excellent and useful framework of physiology accompanying it. The plates are beautifully done, and so plainly represented that any man of fair education can get a good general idea of the anatomy of the horse from them.

The text is printed in good bold type and when the book is opened out on a wide table can be readily referred to when studying the various structures illustrated. The skeleton, the muscular, the circulatory, the respiratory, the digestive, the excretory, the reproductive and the nervous systems are all briefly and lucidly discussed; then follows a small section on the special sense organs.

The work is the best one that we have seen and should find a permanent resting place in the homes of most veterinary students, veterinary surgeons and those interested in the care, rearing and breeding of horses. G. M.

THE COW IN HEALTH AND DISEASE. By G. H. Conn, D.V.M., formerly Veterinary Inspector for the Bureau of Animal Industry of the U.S. Department of Agriculture; Lieutenant, Veterinary Corps, National Army. Pp. 139. Published by the Burton Publishing Co., Kansas City, Missouri. Price 1 dollar.

This is a handy little educational volume written for all those "who have the best interests of the cow at heart." It would have been more

useful if it contained a carefully compiled index, because the next hardest thing to getting cow owners and attendants to read cow-books at all is to get them to turn quickly and with the least trouble to sources of special information. The work deals with the fundamental principles of sanitation and hygiene, the proper care and treatment in common diseases, the care of the dairy and dairy products, municipal requirements and standardisation. There are twenty sections dealing with these matters. Some of the advice and information is written from an American standpoint, and will be more useful to U.S. readers than Britishers, but there is much in the letterpress that is quite interesting and instructive. A wide circulation of the book and an intelligent reading of it, combined with zeal in the daily work of the cowhouse or "barn," cannot but improve the cows and milk of the country.

An educational book should be plain and clear in its statements. In one or two instances it is difficult to understand the author's meaning: *e.g.*, at p. 39, "tuberculosis is caused by a small germ called by the same name *tuberculosis*, but it is spoken of as *bacterin tuberculosis*"; at p. 47, "then the formalin should be poured in *with* potash"; at p. 66, "*bathe well* the region under the throat and between the lower jaw bones with ammonia or white liniment two or three times each day" (Query—How much liniment are you going to use?); at p. 132, it is stated in the milk fever treatment that "*the teat is tensely distended with air*, then the corresponding *teat* is inflated"—surely this is not so? (The italics in all cases are ours).

We think the grading of milk as a general procedure as recommended at p. 16 "is not practicable" (as the lawyers say). In the chapter on "Milk for Infant Feeding" some instructions on the proper feeding of children's cows and the importance of a pure water supply are very important, but are missed. With regard to "keeping the cow clean," the matter of the tail needs discussing particularly.

"Impaction of the Rumen," mentioned at p. 70, ought, we think, to be *paralysis* of the rumen. The paralysis is the first thing to overcome, and more powerful drugs than half-teaspoonfuls of fluid extract of nux vomica and teaspoonful doses of salol are necessary to overcome it. At p. 90, in *pneumonia* we think cold water is better than chilled water. Methylene blue "in two or three times as large doses as is usually used" is recommended in the treatment of contagious abortion.

There are some useful lines on the suppression of milk at p. 113, in which drug treatment by nux vomica, pilocarpine, and jaborandi is recommended. A cheaper remedy, and one quite up to date and reported to be very effective, is to inject one cubic centimetre of the patient's own milk subcutaneously.

As is usual in wartime, there are slips in spelling and spacing which are rather prominent: *e.g.*, "stirility," "occassionally," "torturous," "uroptropin"—(is it worth while mentioning this drug to laymen?)

G.M.

REPORT OF THE VETERINARY DIRECTOR-GENERAL (F. Torrance, B.A., D.V.S.) for Canada, for the year ending March 31, 1917. Printed by J. B. Labroquerie Taché, Ottawa. Price 5 cents.

This report, which has just reached us, is shorter than usual, but contains much interesting matter and gives evidence of a vast amount

of good work done. Canadian live stock have been fairly healthy, and the stamping out of foot-and-mouth-disease in the United States has necessitated less anxiety and vigilance in Canada. The conservation of food supply demands the prevention of tuberculosis by attacking it at its sources and stopping the spread of the disease from cattle to hogs. Sterilisation of the by-products of cheese factories and creameries would greatly aid the checking of the disease. Most glandered horses were again found in Saskatchewan, but there was a reduction of 27 fewer victims than in 1916.

The use of hog cholera serum has resulted in a large saving to the country and to hog raisers; 7,197 hogs were treated with serum, which cost 4,350 dollars, and effeeted an economy of 72,000 dollars to the department and 144,000 dollars to the pig owners. Cattle mange was confined to Southern Alberta and Saskatchewan, and good progress was made against it by systematic dipping. Rabies occurred in Alberta and Ontario and 52 premises were quarantined; 2,991 cattle were tested by the officials for tuberculosis and 2,772 proved healthy; 5,741 cattle were tested by private practitioners and 5,191 proved healthy. All reactors were permanently earmarked by a veterinary inspector where the owner did not voluntarily destroy them. Municipal testing of cattle was undertaken in Saskatchewan and Regina and compensation was given to reactors slaughtered; the milk supply of the two cities benefited greatly, and it is hoped the results will induce other municipalities to follow in the steps of these enlightened cities. There were 11 outbreaks of anthrax and one of scabies in foxes on Prince Edward Island. Mallein, tuberculin, and anti-abortion vaccine, as well as strangles and influenza bacterins were supplied for use by the officers of the department from the biological laboratory at Ottawa. The branch laboratories at Lethbridge and Agassiz also did useful work. Dr. Hadwin's work at Agassiz is specially commended.

There was a heavy demand for meat food for the Allied armies and peoples and the Meat Inspection Division never had a busier time in its experience. The greatly increased amount of work was cheerfully and effectively done. The production of more hogs in Canada is urged; the bacon exports increased 64,000,000 lb. over last year. G. M.

NOTICES.

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